

Instructors are encouraged to build interactivity into distance learning. But what does that mean exactly? This chapter promotes the concept of interaction as a means to an end rather than an end in itself.

Interactivity: From Agents Educational Communications to Outcomes

In the world of distance learning, very few topics have generated as much debate as the construct of interactivity. Distance learning practitioners-particularly instructors and program administrators-seem to view interactivity as the defining attribute of a contemporary distance learning experience. That is, the interactivity enabled by two-way technologies providing real-time exchanges of audio, video, text, and graphical information among distributed participants serves as one of distance learning's primary identifying characteristics.

The use of interactive technologies in a distance learning enterprise also contributes to perceptions of distance learning quality. For example, distance learning experiences that use interactive compressed video may be perceived as being "better" than a distance learning experience using workbooks and videotapes.

For critics, interactivity is frequently noted as the missing ingredient when comparing distance learning experiences with traditional face-to-face learning experiences. For proponents of distance learning, interactivity offers the evidence on which to build a case that a distance learning experience is just as good, if not better than, a traditional face-to-face learning experience.

Interactivity and the "New Media" of Distance Learning

If distance learning defines itself in large part by its dependence on interactive technologies, the increased capability for interactivity enabled by emerging technologies must also be factored into this discussion. High-performance computing and communications systems are resulting in the increased use of wire-line technologies (such as desktop computers, compressed video, and laptop computers) to complement the conferencing technologies (for example, audio-conferencing, videoconferencing, and computer-mediated conferencing) generally associated with distance learning. Wireless technologies (such as personal digital assistants, pagers, and cellular telephones, as well as remote/wireless network interfaces for PCS) make it possible to further extend interactive conferencing models. Finally, the emergence of the World Wide Web and its adaptation for deployment over the Internet and intranets provide a medium of information exchange whose significance as support tool is just now beginning to be realized.

Perhaps most exciting of all is the emergence of "new media" that enable the creation of new instructional experiences (Dede, 1997). These include:

- Multimedia and hypermedia
- Computer-supported collaborative learning
- Interactive knowledge webs
- Virtual communities

Each of these new media represents a specific technology environment, providing unique opportunities for individual users to connect with information resources, instructional experiences, and other technologies on terms established and defined by the users. In these new technology-mediated learning environments, learners can function in self-directed ways while still receiving the support of the community with which they interact. By making learning location-independent, they push distance learning far beyond its current boundaries. Within this continually evolving context, it is increasingly important that the defining construct of interactivity be revisited.

Is It Interactivity-or Interaction?

In distance learning, interaction and interactivity are terms that are often used interchangeably, even though there are several distinctions between them that are worth noting. Wagner (1994) defines interactions as reciprocal events requiring two objects and two actions. Interactions are suggested to occur when objects and events mutually influence one another. Interactivity, on the other hand, appears to emerge from descriptions of technological capability for establishing connections from point to point (or from point to multiple points) in real time. In Wagner's discussion, interactivity tends to focus on the attributes of the technology systems employed in distance learning enterprises. Conversely, interactions typically involve behaviors where individual and groups directly influence one another.

These distinctions are worth noting because they help to underscore the difficulty encountered when offering a description of this defining construct in operational, outcome-specific terms. Philosophical speculations on the role and effect of interaction are easier to generate than are working hypotheses that empirically determine the effect of interaction as a distance learning outcome.

Fascination with what technologies can do may actually confound a practitioner's emphasis on exploiting technologies to maximize teaching and learning outcomes in a distance learning context.

Interaction Agents

Attempting to bring a measure of order to discussions of interaction, Moore offers a schema in which he identifies three types of instructional interactions:

- Interactions that occur between the learner and the instructor
- Interactions that occur among learners
- Interactions that take place between learners and the content they are trying to master

One of the greatest benefits this has offered designers, implementers, and administrators of distance learning programs is a sense of direction to the transactions that are typically involved in a distance learning endeavor. Furthermore, Moore's interaction schema implies purpose, intent, and/or intended outcome of an interaction by virtue of indicating who or what is to be involved in a transaction. However, the explicit description of an interaction's purposes, intents, and outcomes are still left to the imagination. Moore's schema does not really describe the intended outcomes of these interaction categories. Instead it identifies the agents involved in or affected by a given interaction. In other words, it describes with whom-or with what-interactions will occur, within the context of a specific distance learning transaction.

Given the explosion of technology in the past decade, combined with the integration of interactive technologies in nearly every facet of life, it may be that focusing on real-time, technologically enabled interactivity as a defining attribute of distance learning is an artifact of the past. The value of interactive technologies as a resource for extending the reach of instruction and information can now more easily emerge as a means to an end. The earlier emphasis on the agents of an interaction can now help set the stage for a more meaningful discussion of the outcomes enabled by various types of interactions.

Interaction Outcomes

Focusing on the outcomes of interaction rather than the agents of interaction permits interactions to serve more effectively as a means to the end of performance improvement. In this context, interactions have two purposes: They must change learners, and they must move learners toward an action state of goal attainment.

By emphasizing the outcome of an interaction, one can see the effect that that an interaction has on learners, whether the learner is in distance learning or a traditional learning endeavor. Interactions enable active participation in the instructional/training/performance improvement process. They allow learners to tailor learning experiences to meet their specific needs or abilities. Interactions enable clarification and transfer of new ideas to already-held concept frameworks. Interactions promote intrinsic motivation on the part of a learner by highlighting the relevancy that new information may under specific circumstances.

The significance of this shift in thinking can be more clearly recognized if we consider why a focus on outcomes of instruction is so important in this third decade of the "information age." Basic assumptions underlying the current systems available for educating children, for transitioning learning from school to the workplace, and for providing continuous learning opportunities in the workplace appear to be fundamentally flawed, given current social expectations of flexibility, adaptability, and creativity. Furthermore, in today's competitive global marketplace, organizational success regardless of level is increasingly built on a foundation of skilled, self-motivated, and engaged individuals with the capacity for managing their continuous learning needs. Basic information literacy and numeric proficiency are necessary but no longer sufficient to successful in school or in the workplace. Being able to think creatively, to solve problems, and to accommodate ambiguous situations are expected in addition to literacy and numeric skills. The evolving impact of technology on performance expectations adds to this mix. That is, if information is now assumed to be available at one's fingertips, it is far less critical that one memorize a massive store of facts and concepts when engaged in a learning endeavor. Instead the ability to access, interpret, and apply information becomes a far more reasonable goal toward which to strive.

Types of Interactions

In building interaction into learning, the following types of interactions should be considered:

Interaction to increase participation. According to McCombs (1992), learning is a natural process of pursuing meaningful goals. It is active, volitional, as what and internally mediated, representing a process of discovering and constructing meaning from information and experience. Given this description, it is clear that learning depends in large part on an individual's willingness to engage in the learning process.

Interaction to increase participation. This type of interaction provides learners with a means of engagement. It may mean meeting fellow learners for the first time so that the basic level at which human relationships occur is established, or it may emphasize the willingness of individuals to assume leadership responsibilities for members of their particular cohort group.

Interaction to develop communication. Clearly articulating expectations, providing opportunities for personal expression, offering the ability to exchange information without fear of being judged or punished, persuading individuals to subscribe to a particular point of view or to recognize the value of making a change (whatever that change might be)-these are all examples of

interactions for improving communications. Interaction offers the ability to share information and opinions or to intentionally influence the opinions or beliefs of others, all of which are germane to instructional, training, and/or performance support settings.

Interaction to receive feedback. Feedback refers to any information that allows learners to judge the quality of their performance. Wagner's (1994) review of feedback literature refers to a variety of conditions of feedback, noting that feedback tends to be considered from two differing perspectives. From a behavioristic perspective, feedback provides reinforcement, which is intended to correct and direct performance. Cognitivists suggest that feedback provides learners with information about the correctness of a response or allows learn to correct an incorrect response to enable long-term retention of correct information. In either case, learners need to obtain information from a variety of sources (from instructions, from other learners, from their own observations, from information resources) to judge the quality of their own performance.

Interaction to enhance elaboration and retention. From a cognitive perspective, elaborating on information (that is, coming up with alternative examples to explain a new idea, or developing alternative explanations for why an idea may be framed in a particular way) makes new information more meaningful for learners. By expanding or even manipulating a bit of information associated with a given idea, it is easier to recognize all of the various conceptual "hooks" that may be associated with that information. The extra cognitive "practice" that results from generating alternative interpretations makes it easier for learners to integrate new information into their existing cognitive framework for enhanced long-term retention and recall.

Interaction to support learner control/self-regulation. Interaction provides learners with the information needed to manage the depth of study, range of content covered, type of alternative media needed for information presentations, and time actually spent on a specific learning task (Kinsey, 1990). McCombs (1992) notes that the depth and breadth of information processed, as well as what and how much is learned and remembered, are influenced by the following factors:

- Self-awareness and beliefs about personal control, competence, and ability
- Clarity and salience of personal values interests, and goals
- Personal expectations for success and failure
- Affect, emotion, and general states of mind and the resulting motivation to learn

Interaction for learner control or self-regulation is particularly important within the context of preparing individuals to be lifelong learners, since it deals with the ability of a learner stay on task, to mediate the need for additional information to complete one's understanding, and to recognize when the learning task has been completed.

Interaction to increase motivation. McCombs (1992) observes that individuals are naturally curious and enjoy learning. However, they acknowledge that intense negative conditions and emotions (for example, feeling insecure; worrying about failure; being self-conscious or shy; or fearing corporal punishment, ridicule, or stigmatizing labels) can thwart this enthusiasm. The degree to which a learner can ascertain the presence or absence of these and other limiting factors will have a direct impact on his or her ability to learn. Therefore, interaction provides opportunities for making these determinations through asking questions, clarifying statements, reviewing guidelines, and so on.

Interaction for negotiation of understanding. Determining the willingness of another individual to engage in a dialogue, to come to consensus, or to agree to conform to terms of an agreement are all examples of interactions for negotiation. Negotiations in learning are particularly relevant in a time where constructivist learning models are used to explain how individuals can use their own (appropriate) interpretations of reality to enhance relevancy, motivation, and application. In addition, being able to clearly articulate and agree on the terms of a learning agreement increases the likelihood of achieving a successful outcome

Interaction for team building. In order to understand the importance of interaction as a strategy for building a team, it is important to understand a bit about the dynamics of team development. Newell, Wagner, and Gerner (1988) observe that there are four stages of team development.

- *Membership*, where individual members of a learning cohort or workgroup determine where they fit in the overall social and task structure of the group.
- *Sub groupings*, where individuals identify with other individual team members to form associations and friendships, at times to the exclusion of others within the cohort or workgroup
- *Confrontation*, where individuals' behaviors disrupt the overall flow of collaboration and participation. This stage is characterized by an "us versus them" mentality that makes it difficult to achieve any collaborative group outcome
- *Shared leadership*, where disagreements occur but are focused more around tasks and issues than around individuals or subgroups of individuals. Individual uniqueness is valued, but no more than is the collective team effort. The team shares information easily, there is real commitment to meeting goals of the group, and responsibility for achieving these goals is shared.

Interaction for team building is necessary to ensure that individual members of a team actively support the goals of the group. Interactions facilitate such desirable behaviors as recognition and acceptance of individual differences, expression of respect for the team as well as for its members, effective listening, a shared sense of responsibility, and the ability to confirm expectations within the group.

Interaction for discovery. "Pushing the envelope" is a phrase that captures the excitement of structuring information so that new interpretations of that information are enabled. It is highly unusual for new discoveries to occur in an intellectual vacuum. This category of interaction refers to the cross-fertilization of ideas that occurs when people share their ideas and perspectives with one another in the pursuit of defining new constructs.

Interaction for exploration. Closely related to "interaction for discovery" interaction for exploration provides a vehicle for defining the scope, depth, and breadth of a new idea. It is also important to distinguish a new idea from extant ideas. This category of interaction helps define the parameters within which such distinctions can be made.

Interaction for clarification of understanding. This relates to the ability to navigate one's way through a sea of performance expectations that may or may not be clearly articulated. An example of this category of interaction may include determining whether one's personal interpretation is what another person actually intended by restating expectations in one's own words.

Interaction for closure. Just as learners need to know where to begin a specific learning endeavor, they also need to know when they are done with the endeavor. In an era marked by access to almost limitless information resources, the ability to "bound" an activity is critical, whether one is writing a term paper or staying "in scope" on a contracted project. This means being able to determine what expectations exist and also to determine when those expectations have been met. It is a rare individual who can make these determinations without engaging in dialogue.

Applying Interaction in Practice

Using the categories of interaction noted above as conceptual benchmarks, it is fairly easy to make the case that interaction is a necessary ingredient for a quality learning experience. What is not so clear, at least not when interaction is viewed as an independent construct, is the value that interaction brings to a learning endeavor. For example, one might attempt to quantify the amount of interaction that is needed to ensure the quality of a learning experience. One may be interested in determining how often interaction should occur for a learning experience to be effective. There may even be some interest in determining what types of interaction are the most effective. However, it is hard to imagine that the result of any of these inquiries would offer any useful insights or understandings.

The best rule of thumb for effectively designing an interactive learning experience-whether it happens to be distance learning, on-line learning, or face-to-face, instructor-led learning experiences-is to first consider the goals and objectives of a specific learning experience. From this perspective, it is both far more appropriate and effective to begin the process of selecting the strategies and tactics needed to achieve the desired ends of the learning experience, for the specific audience at hand, given the specific conditions likely to be encountered in a given setting. In this way, interaction can serve as an outcome of clearly conceptualized, well-designed, and well-developed instruction and training.

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